Kramer Electronics, Ltd.

USER MANUAL

Model:

FC-113

HDMI to SD/HD-SDI Converter

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing the Kramer DigiTOOLS® **FC-113** *HDMI to SD/HD-SDI Converter,* which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging
- HDMI to SD/HD-SDI Converter for medical equipment

The package includes the following items:

- **FC-113**
- Power supply (5V DC input)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

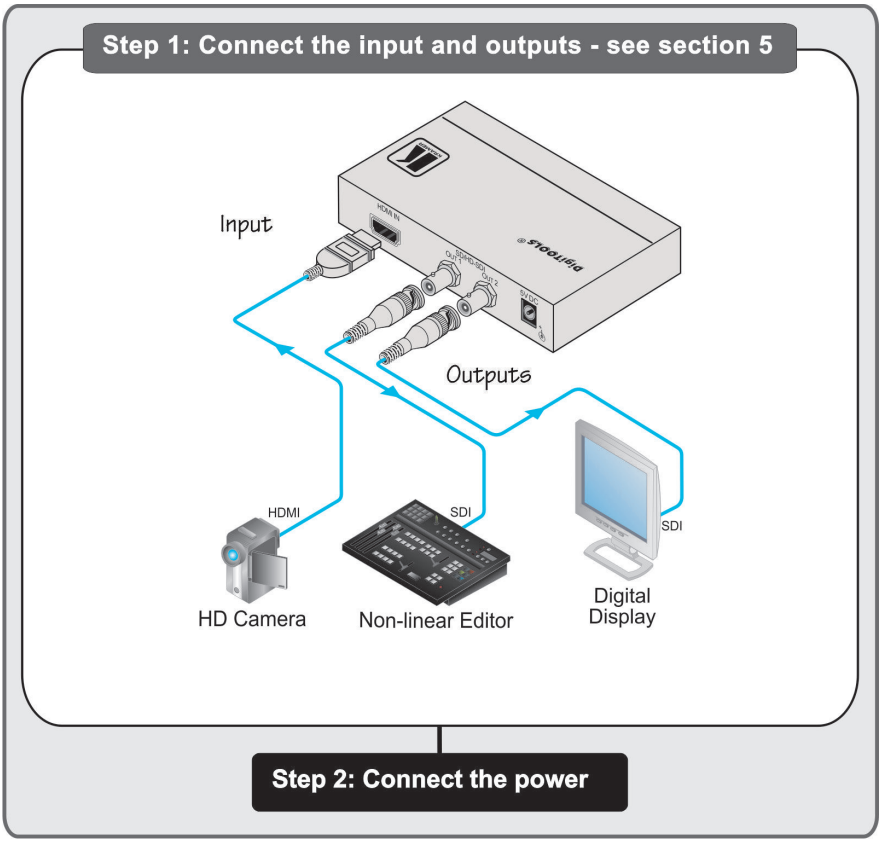
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

The **FC-113** *HDMI to SD/HD-SDI Converter* is a high-performance format converter for SDI (SMPTE 259M), HD-SDI (SMPTE 292M), and 3G HD-SDI (SMPTE 424M) signals. It converts an HDMI input to two identical SDI video with embedded audio output signals. The **FC-113** does not perform frame rate or resolution conversion[1].

1 It has to receive an HD or SD signal to convert it to SD/HD-SDI signals

The **FC-113** features:

- One HDMI input
- Two SD/HD-SDI/3G HD-SDI outputs on BNC connectors
- HDTV compatibility
- Active LED indicators on the front panel. Green indicates a standard (SDI) definition and blue indicates a (HD-SDI) high-definition input signal
- 5V DC power
- Medical equipment compliance

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter and an HDCP Licensee.

In particular, HDMI[2]:

- Provides a simple[3] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single[4] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[5] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed High

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

4 HDMI technology has been designed to use standard copper cable construction at up to 15m

5 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

Definition digital video via a single cable[1], and user-friendly connector

- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p @60), as well as standard definition formats such as NTSC or PAL.

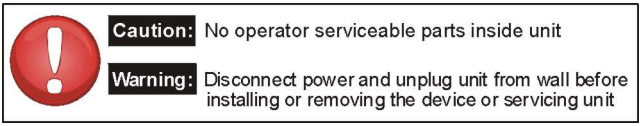
3.2 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard[2], protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals[3].

3.3 Recommendations for Best Performance

To achieve the best performance:

- Use only good quality connection cables[4] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **FC-113** away from moisture, excessive sunlight and dust


Caution:
No operator serviceable parts inside unit
Warning:
Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

1 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

2 Developed by Intel

3 It is illegal to convert the input signal to HD-SDI

4 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

3.4 Accessory to Medical Equipment (IEC 60601-1)

In the modern medical environment remote access is essential, for example, to transfer clinical data between doctors and to train to medical students. The **FC-113** is certified according to the IEC 60601-1-2, Clause 2.1.3, Medical Electrical Equipment, Part 1: General Requirements for Emc standard which is required when accessory devices are used at locations where medical personnel and patients are present.

The **FC-113** constitutes an optional component that can be considered necessary and suitable as part of medical equipment or for use as part of a medical system to provide real time simultaneous video feeds to those present at the local medical environment and at remote locations. In this environment, the **FC-113** can be added to the system ONLY if the connecting equipment has been evaluated and meets the IEC 60601-1-2 Emc standards. Note, that when attaching accessory devices to a digital or analog interface, they must comply with the IEC standard for which they are used: for medical equipment (IEC 60601-1-2), data processing equipment (IEC 60950) and electromagnetic compatibility (IEC 61000-1).

4 Defining the FC-113 HDMI to SD/HD-SDI Converter

Figure 1 and Table 1 define the **FC-113** *HDMI to SD/HD-SDI Converter.*

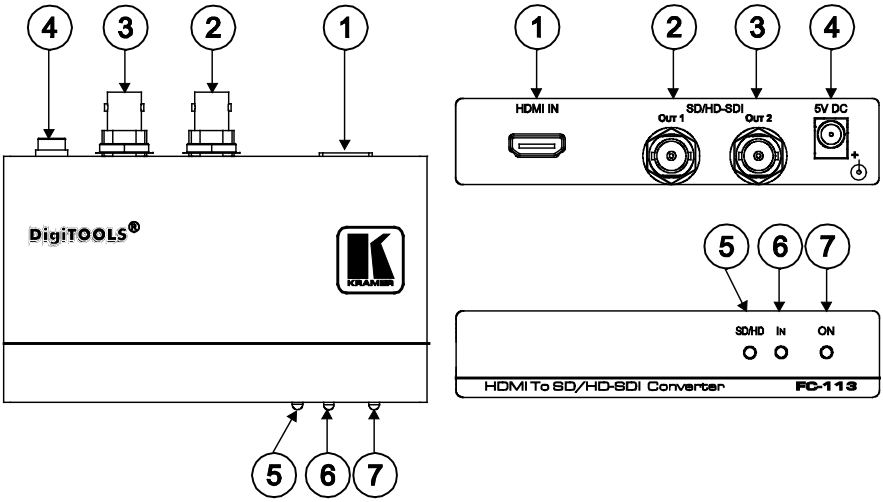


Figure 1: FC-113 HDMI to SD/HD-SDI Converter

Table 1: FC-113 HDMI to SD/HD-SDI Converter Features

#	Feature	Function
1	*HDMI IN* Connector	Connect to an HDMI source
2	*SD/HD-SDI OUT 1* BNC Connector	Connect to an SD or HD-SDI acceptor 1
3	*SD/HD-SDI* OUT 2 BNC Connector	Connect to an SD or HD-SDI acceptor 2
4	*5V DC*	+5V DC connector for powering the unit
5	*SD/HD* LED	Lights green for an SD input signal and blue for an HD-SDI input signal
6	*IN* LED	Lights green to indicate an HDMI signal
7	*ON* LED	Lights green when receiving power

5 Connecting the FC-113 HDMI to SD/HD-SDI Converter

To connect[1] the **FC-113**, as illustrated in Figure 2:

1. Connect an HDMI source (for example, a video camera) to the HDMI IN connector.
2. Connect the SD/HD-SDI OUT 1 connector to an acceptor (for example, a non-linear editor).
3. Connect the SD/HD-SDI OUT 2 connector to a digital display.
4. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in Figure 2).

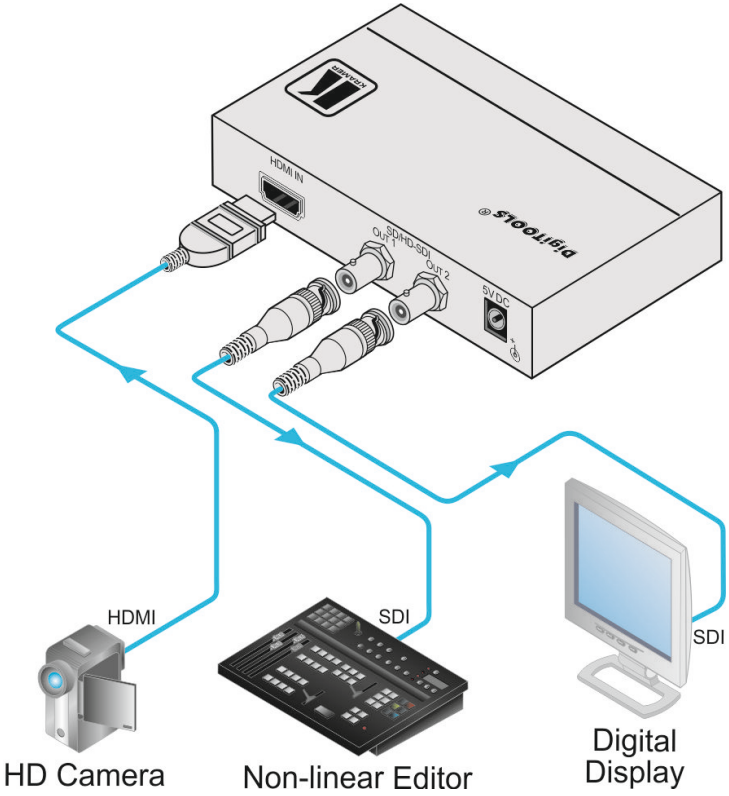


Figure 2: Connecting the FC-113 HDMI to SD/HD-SDI Converter

1 Switch off the power on each device before connecting it to your FC-113. After connecting your FC-113, switch on its power and then switch on the power on each device

6 Technical Specifications

The **FC-113** technical specifications are shown in Table 2:

Table 2: Technical Specifications[1] of the FC-113 HDMI to SD/HD-SDI Converter

INPUT:	1 HDMI connector
OUTPUTS:	2 SD/HD-SDI, 3G HD-SDI on BNC connectors
INPUT FORMATS:	525i, 625i 1080p @23.98/24/25/29.97/30/50/59.94/60 1080i @50/59.94/60 720p @50/59.94/60
OUTPUT FORMATS:	SMPTE-259M/292M/424M
MAX DATA RATE:	Up to 3Gbps
STANDARD COMPLIANCE:	HDMI
INDICATOR LEDS:	SD/HD, OUT, ON
POWER SOURCE:	5V DC, 440mA
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1.0") W, D, H
WEIGHT:	0.3kg (0.67lbs)
ACCESSORIES:	Power supply
OPTIONS:	19” rack mount adapter

1 Specifications are subject to change without notice

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

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Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

For the latest information on our products and a list of Kramer distributors visit www.kramerelectronics.com **where updates to this user manual may be found. We welcome your questions, comments and feedback.**

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

P/N: 2900-000528 Rev: 5

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000528 REV 5